

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Coincidental Maximum Load

Date: November 17, 2022
Hours: 18:00 Hours

| Date | Time | Load(MW) |
|----------|----------|----------|
| 7-Nov-22 | 18:11hrs | 609.06 |

| Sl. No. | Hydropower Plant | Unit | MW | Transmission Lines and Elements | Load (MW) | Remarks |
|--------------|------------------|---|---------------|---|---------------|---|
| 1 | 1020MW THP | Unit- I | 0.00 | 400kV THP - Siliguri Line - I | 0.00 | Unit-I & II under Shutdown. Unit-IV on Standby. 400kV Tala-Malbase line under Shutdown. 400kV THP - Siliguri Line- I on Standby. |
| | | Unit- II | 0.00 | 400kV THP - Siliguri Line - II | 184.98 | |
| | | Unit- III | 97.91 | 400kV THP - Siliguri Line- IV | 177.98 | |
| | | Unit- IV | 0.00 | 400kV THP - Malbase Line - III | 0.00 | |
| | | Unit- V | 128.28 | 400kV Malbase - Siliguri Line | -78.37 | |
| | | Unit- VI | 138.97 | - | - | |
| | | Total | 365.16 | Auxiliary Consumption & Transformation Losses at Generator end | 0.60% | |
| 2 | 720MW MHP | Unit-I | 115.13 | 400kV MHP - Jigmeling Line - I | 0.00 | Unit-II on standby. Unit-III under shutdown. 400kV MHP-JLG Line I, II & IV on Standby. 132kV MHP_Yurmoo line I not in service. 400kV JLG_ALI Direct line II Standby. 400kV JLG_ALI Line II (Interim) on Standby. |
| | | Unit-II | 0.00 | 400kV MHP - Jigmeling Line - II | 0.00 | |
| | | Unit-III | 0.00 | 400kV MHP - Jigmeling Line - III | 104.16 | |
| | | Unit-IV | 79.98 | 400kV MHP - Jigmeling Line - IV | 0.00 | |
| | | - | - | 132kV MHP - Yurmo Line - I | 0.00 | |
| | | - | - | 132kV MHP - Yurmo Line - II | 90.41 | |
| | | - | - | 500MVA, 400/220kV ICT at Jigmeling (HV) | 107.21 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | -1.66 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 0.00 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | -2.02 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 0.00 | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 12.08 | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 12.37 | |
| | | - | - | 220kV Tsirang - Jigmeling Line | -18.71 | |
| - | - | 132kV Gelephu - Salakati Line | 0.03 | | | |
| Total | 195.11 | Auxiliary Consumption & Transformation Losses at Generator end | 0.28% | | | |
| 3 | 336MW CHP | Unit- I | 0.00 | 220kV CHP - Birpara Line- I | 2.31 | Unit-I under Shutdown. |
| | | Unit- II | 67.09 | 220kV CHP - Birpara Line- II | 2.40 | |
| | | Unit- III | 67.55 | 220kV CHP - Malbase Line- III | 62.12 | |
| | | Unit- IV | 50.24 | 220kV CHP - Semtokha Line- IV | 84.83 | |
| | | - | - | 220kV Malbase - Birpara Line | -44.95 | |
| | | - | - | 66kV CHP - Chumdo Line | 24.05 | |
| | | - | - | 66kV CHP - Gedu Line | 8.09 | |
| | | - | - | 3x3MVA, 66/11kV TFR | 1.92 | |
| Total | 184.88 | Auxiliary Consumption & Transformation Losses at Generator end | -0.45% | | | |
| 4 | 24MW BHP (U/S) | Unit- I | 6.20 | 220kV BHP - Semtokha Line | 63.26 | |
| | | Unit- II | 6.00 | 66kV BHP - Lobeyasa Line | 28.84 | |
| | | Total | 12.20 | 220kV BHP - Tsirang Line | -54.88 | |
| 5 | 40MW BHP (L/S) | Unit- I | 12.30 | 5MVA, 66/11kV TFR | 0.81 | |
| | | Unit- II | 13.10 | 30MVA ICT, 220/66kV (HV) | 17.84 | |
| | | Total | 25.40 | Auxiliary Consumption & Transformation Losses at Generator end | -1.14% | |
| 6 | 126MW DHP | Unit-I | 40.84 | 220kV DHP - Tsirang Line | 40.60 | Unit-II on Standby. 220kV DHP_Dagapela Line on Standby. |
| | | Unit-II | 0.00 | 220kV DHP - Dagapela Line | 0.00 | |
| | | - | - | 220kV Jigmeling - Dagapela Line | 63.00 | |
| | | - | - | 5MVA, 220/33kV TFR | 0.22 | |
| Total | 40.84 | Auxiliary Consumption & Transformation Losses at Gen. end | 0.05% | | | |
| 7 | 60MW KHP | Unit- I | 0.00 | 132kV KHP - Nangkhon Line | 16.49 | Unit I on Standby. |
| | | Unit-II | 12.97 | 132kV KHP - Kilikhar Line | 21.51 | |
| | | Unit- III | 13.01 | 5MVA, 132/11kV TFR | 0.67 | |
| | | Unit- IV | 12.97 | 132kV Motanga - Rangia Line | 12.64 | |
| | | Total | 38.95 | Auxiliary Consumption & Transformation Losses at Generator end | 0.72% | |

Note: Generation-Load Summary (MW) for November 17, 2022 at 18:00hrs.

| Sl. No | Region | Total Generation (MW) | Total Load [Generation - Export (MW)] | Total Load [Feeder Summation (MW)] | Total Export/Import (MW) | Auxiliary Consumption & Transformation Losses (MW) |
|--------------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|--|
| 1 | Western Grid | 628.48 | 402.84 | 401.89 | 244.35 | 0.95 |
| 2 | Eastern Grid | 234.06 | 206.36 | 205.54 | 8.99 | 0.82 |
| Total | | 862.54 | 609.20 | 607.43 | 253.34 | 1.77 |

Note: Generation-Load Summary for November 17, 2021 at 18:00hrs.

| Sl. No | Region | Total Generation (MW) | Total Load [Generation - Export (MW)] | Total Load [Feeder Summation (MW)] | Total Export/Import (MW) | Auxiliary Consumption & Transformation Losses (MW) |
|--------------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|--|
| 1 | Western Grid | 757.09 | 328.92 | 336.72 | 431.28 | -7.80 |
| 2 | Eastern Grid | 238.26 | 83.00 | 81.90 | 152.15 | 1.10 |
| Total | | 995.35 | 411.92 | 418.62 | 583.43 | -6.70 |

1. The Instantaneous load balance,calculated as (Total generation - (Total export-Import) - Total domestic load), do not tend towards zero. This could be due to the following reasons:

- i) Not all the meters are digital and nor are all the meter at all locations can be read at same time (say 9:00hrs) due to many meter to be read manually.
- ii) The clocks of all the locations are not synchronized.

2. This report is generated to give an idea of the generation & load flow for the system at a particular instant.

BHUTAN POWER SYSTEM OPERATOR LOAD-GENERATION BALANCE REPORT

Coincidental Maximum Load

Date: November 18, 2022
Hours: 09:00 Hours

| Date | Time | Load(MW) |
|----------|----------|----------|
| 7-Nov-22 | 18:11hrs | 609.06 |

| Sl. No. | Hydropower Plant | Unit | MW | Transmission Lines and Elements | Load (MW) | Remarks |
|--------------|------------------|---|---------------|---|---------------|---|
| 1 | 1020MW THP | Unit- I | 0.00 | 400kV THP - Siliguri Line - I | 0.00 | Unit-I & II under Shutdown. Unit-IV on Standby. 400kV Tala-Malbase line under Shutdown. 400kV THP - Siliguri Line- I on Standby. |
| | | Unit- II | 0.00 | 400kV THP - Siliguri Line - II | 166.05 | |
| | | Unit- III | 99.34 | 400kV THP - Siliguri Line- IV | 158.84 | |
| | | Unit- IV | 0.00 | 400kV THP - Malbase Line - III | 0.00 | |
| | | Unit- V | 88.68 | 400kV Malbase - Siliguri Line | -57.74 | |
| | | Unit- VI | 138.56 | - | - | |
| | | Total | 326.58 | Auxiliary Consumption & Transformation Losses at Generator end | 0.52% | |
| 2 | 720MW MHP | Unit-I | 110.17 | 400kV MHP - Jigmeling Line - I | 0.00 | Unit-III & IV under shutdown. 400kV MHP-JLG Line I, II & IV on Standby. 132kV MHP_Yurmoo line I not in service. 400kV JLG_ALI Direct line II Standby. 400kV JLG_ALI Line II (Interim) on Standby. |
| | | Unit-II | 110.13 | 400kV MHP - Jigmeling Line - II | 0.00 | |
| | | Unit-III | 0.00 | 400kV MHP - Jigmeling Line - III | 138.83 | |
| | | Unit-IV | 0.00 | 400kV MHP - Jigmeling Line - IV | 0.00 | |
| | | - | - | 132kV MHP - Yurmo Line - I | 0.00 | |
| | | - | - | 132kV MHP - Yurmo Line - II | 80.25 | |
| | | - | - | 500MVA, 400/220kV ICT at Jigmeling (HV) | 89.61 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Interim) | 18.35 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Interim) | 0.00 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - I (Direct) | 28.42 | |
| | | - | - | 400kV Jigmeling - Alipurduar Line - II (Direct) | 0.00 | |
| | | - | - | 80MVA, 220/132kV ICT - I (HV) | 8.52 | |
| | | - | - | 80MVA, 220/132kV ICT - II (HV) | 8.69 | |
| | | - | - | 220kV Tsirang - Jigmeling Line | -11.92 | |
| - | - | 132kV Gelephu - Salakati Line | 1.29 | | | |
| Total | 220.30 | Auxiliary Consumption & Transformation Losses at Generator end | 0.55% | | | |
| 3 | 336MW CHP | Unit- I | 0.00 | 220kV CHP - Birpara Line- I | 3.24 | Unit-I & II under shutdown. |
| | | Unit- II | 0.00 | 220kV CHP - Birpara Line- II | 3.20 | |
| | | Unit- III | 87.29 | 220kV CHP - Malbase Line- III | 60.65 | |
| | | Unit- IV | 72.75 | 220kV CHP - Semtokha Line- IV | 65.65 | |
| | | - | - | 220kV Malbase - Birpara Line | -41.38 | |
| | | - | - | 66kV CHP - Chumdo Line | 18.78 | |
| | | - | - | 66kV CHP - Gedu Line | 6.65 | |
| | | - | - | 3x3MVA, 66/11kV TFR | 1.32 | |
| Total | 160.04 | Auxiliary Consumption & Transformation Losses at Generator end | 0.34% | | | |
| 4 | 24MW BHP (U/S) | Unit- I | 5.89 | 220kV BHP - Semtokha Line | 61.45 | |
| | | Unit- II | 5.89 | 66kV BHP - Lobeyasa Line | 24.69 | |
| | | Total | 11.78 | 220kV BHP - Tsirang Line | -49.61 | |
| 5 | 40MW BHP (L/S) | Unit- I | 12.42 | 5MVA, 66/11kV TFR | 0.42 | |
| | | Unit- II | 12.30 | 30MVA ICT, 220/66kV (HV) | 13.20 | |
| | | Total | 24.72 | Auxiliary Consumption & Transformation Losses at Generator end | -1.23% | |
| 6 | 126MW DHP | Unit-I | 40.61 | 220kV DHP - Tsirang Line | 40.37 | Unit-II on Standby. 220kV DHP_Dagapela Line on Standby. |
| | | Unit-II | 0.00 | 220kV DHP - Dagapela Line | 0.00 | |
| | | - | - | 220kV Jigmeling - Dagapela Line | 61.43 | |
| | | - | - | 5MVA, 220/33kV TFR | | |
| Total | 40.61 | Auxiliary Consumption & Transformation Losses at Generator end | 0.59% | | | |
| 7 | 60MW KHP | Unit- I | 0.00 | 132kV KHP - Nangkhoh Line | 19.62 | Unit-I on standby. |
| | | Unit-II | 12.24 | 132kV KHP - Kilikhar Line | 16.66 | |
| | | Unit- III | 12.22 | 5MVA, 132/11kV TFR | 0.50 | |
| | | Unit- IV | 12.55 | 132kV Motanga - Rangia Line | 9.40 | |
| | | Total | 37.01 | Auxiliary Consumption & Transformation Losses at Generator end | 0.62% | |

Note: Generation-Load Summary (MW) for November 18, 2022 at 09:00hrs.

| Sl. No | Region | Total Generation (MW) | Total Load [Generation - Export (MW)] | Total Load [Feeder Summation (MW)] | Total Export/Import (MW) | Auxiliary Consumption & Transformation Losses (MW) |
|--------------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|--|
| 1 | Western Grid | 563.73 | 343.44 | 341.41 | 232.21 | 2.03 |
| 2 | Eastern Grid | 257.31 | 187.93 | 186.48 | 57.46 | 1.45 |
| Total | | 821.04 | 531.37 | 527.89 | 289.67 | 3.48 |

Note: Generation-Load Summary for November 18, 2021 at 09:00hrs.

| Sl. No | Region | Total Generation (MW) | Total Load [Generation - Export (MW)] | Total Load [Feeder Summation (MW)] | Total Export/Import (MW) | Auxiliary Consumption & Transformation Losses (MW) |
|--------------|--------------|-----------------------|---------------------------------------|------------------------------------|--------------------------|--|
| 1 | Western Grid | 738.69 | 343.43 | 346.96 | 403.98 | -3.53 |
| 2 | Eastern Grid | 244.43 | 53.21 | 51.34 | 182.50 | 1.87 |
| Total | | 983.12 | 396.64 | 398.30 | 586.48 | -1.66 |

1. The Instantaneous load balance,calculated as (Total generation - (Total export-Import) - Total domestic load), do not tend towards zero. This could be due to the following reasons:

- i) Not all the meters are digital and nor are all the meter at all locations can be read at same time (say 9:00hrs) due to many meter to be read manually.
- ii) The clocks of all the locations are not synchronized.

2. This report is generated to give an idea of the generation & load flow for the system at a particular instant.